

# Remarks on the Bats of the Genus *Vampyrops*<sup>1</sup>

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The genus *Vampyrops* was described by Peters in 1865 with *Phyllostoma lineatum* Geoffroy as the type species, and including *Artibeus vittatus* Peters. Since then, ten other forms have been described: Peters (two), Thomas (five), H. Allen, Miller, and Lyon (one each). In this paper but five species are recognized.

Examples of this genus, with the exception of *lineatus* and *helleri*, have never been available in series. The amount of individual variation has been imperfectly known and seldom has one species been compared directly with another. Chicago Natural History Museum has recently received a series of *V. fumosus* and a few specimens of other species. These, with material examined in other collections, make it possible to clarify somewhat the status and relationship of the members of the genus. There are, however, a number of questions that cannot be fully answered with the specimens now available.

All but three of the known forms were represented in the 158 specimens examined. These were 84 skins with skulls, 13 skins only, 13 skulls from specimens in alcohol, and 61 specimens preserved in alcohol.

I wish to thank Miss Eleanor M. O. Laurie of the British Museum (Natural History) for comparing two specimens from Peru with near topotypes of *V. vittatus* from Venezuela.

## Genus **VAMPYROPS** Peters

*Vampyrops* Peters, 1865, Monatsber. Akad. Wiss. Berlin, 1865: 356; Miller, 1907, Bull. U. S. Nat. Mus., 57: 155.

*Type species.*—*Phyllostoma lineatum* E. Geoffroy.

<sup>1</sup> This work was done in part by a research grant from the National Science Foundation.

*Distribution*.—This genus is known from southern Mexico south to southeastern Peru and southern Brazil. Three species occur together in the Andean region, one species in eastern and one in northeastern South America.

The smallest species, *helleri*, ranges from southern Mexico (Oaxaca and Chiapas) through Central America and down the west coast of South America to Pozuzo, Department of Huanuco, in southeastern Peru. It extends eastward to Trinidad and French Guiana.

In eastern South America is found *lineatus*, a medium-sized species. It ranges from Pernambuco to Santa Catarina, Brazil, and west through Paraguay and southern Mato Grosso to eastern Bolivia (Santa Cruz). Its range does not overlap that of *helleri*.

The species *recifinus*, larger than *helleri* and slightly smaller than the minimum for *lineatus*, overlaps the ranges of both these species and fills the gap between them. This, however, is based on the four specimens known, which came from Ceara, Minas Gerais, and Pernambuco, Brazil, and Demerara, British Guiana.

In the Andean chain are two other species, *vittatus* and *dorsalis*, a large and a medium-sized species, respectively. Both are known from Venezuela, Colombia, Ecuador, and Peru. The type of *fumosus* (= *vittatus*) is from the Purus River, western Brazil. Dobson recorded one specimen of *vittatus* from Costa Rica, purchased by the British Museum (Natural History). However, extensive collecting in Costa Rica and Panama has failed to produce any more specimens, so the locality is open to question.

*Habitat*.—There are few published observations on habitat. Herskovitz found both *vittatus* and *dorsalis* under roots on canyon walls and stream banks. Lyon reported *helleri* from vegetation at the base of cliffs. In Peru, the type of *infuscus* (= *vittatus*) came from a cave, and many specimens from southeastern Peru were taken in caves. Others were found in an old building. The southern Peruvian specimen of *dorsalis* was taken in "moss on a tree" at an altitude of 2,000 meters. Some Ecuadorian examples are labeled as being taken from holes in trees and from termite nests, but this information is not believed to be reliable.

*Characters*.—Bats of medium size, forearm 36.5–61.5 mm.; greatest length of skull 20.0–32.7. Light facial and dorsal stripes usually present. Edge of tail membrane fringed with hair.

The color in most of the species is dark brown or black, marked with a white or gray dorsal stripe extending from between the ears

to the tail membrane. There are also narrow facial stripes from the side of the nose to the ears. These dorsal and facial stripes may be very faint or may be absent in some individuals. There is no external tail, and the membrane is narrow. A well-formed nose leaf is present. In the wings, the fourth metacarpal is the shortest and the third and fifth are subequal. The second phalanges of all fingers are but a little longer than the first phalanges. The wings attach to the base of the first toe, and the wing tips are sometimes white. In all species the ears are rounded and medium in size.

In the skull, the rostrum is almost as long as the braincase. The palate extends well beyond the level of the last molar and its posterior edge is either rounded or V-shaped. The zygomatic width is greater than the mastoid width, and the width across the outer edges of the second molar is greater than the length of the tooth row, canine to last molar.

Dental formula:  $i \frac{2-2}{2-2} \ c \frac{1-1}{1-1} \ pm \frac{2-2}{2-2} \ m \frac{2-3}{2-3} = 32$ .

Inner upper incisors larger than the outer, their bases separate but with tips touching; outer incisors small; upper incisors sometimes filling the space between the canines; lower incisors small, not crowded, filling the space between the canines; canines long and slender;  $pm^3$  half the height of  $pm^4$ ;  $pm^3$  with well-developed cingulum;  $pm^4$  with secondary cusp on cutting edge; lower premolars pointed;  $pm_2$  about two-thirds the height of  $pm_4$ ;  $m^1$  and  $m^2$  about equal in size and shape, with cingula and outer cusps prominent;  $m^3$  present, varying in size; lower molars with well-developed cusps,  $m_3$  about one-fourth the size of  $m_2$ .

### *Vampyrops vittatus* Peters

*Artibeus vittatus* Peters, 1859, Monatsber. Akad. Wiss. Berlin, 1859: 225.

*Vampyrops vittatus* Peters, 1865, Monatsber. Akad. Wiss. Berlin, 1865: 356 (gen. descr.); Gray, 1866, Proc. Zool. Soc. London, 1866: 116; Dobson, 1878, Cat. Chiropt., p. 524, pl. 29, figs. 1, 1a (teeth); Alston, 1879, Biol. Centr.-Amer., p. 49, pl. 3, fig. 7—Costa Rica, Venezuela; Allen, 1900, Bull. Amer. Mus. Nat. Hist., 13: 88—Colombia; op. cit., 20: 458—Colombia; Miller, 1902, Proc. Acad. Nat. Sci. Philadelphia, 1902: 406—Colombia (meas.); Goodwin, 1946, Bull. Amer. Mus. Nat. Hist., 87: 320—Costa Rica (meas.).

*Vampyrops infuscus* Peters, 1880, Monatsber. Akad. Wiss. Berlin, 1880: 259, figs. 2, 2a (head, ear); Sanborn, 1951, Publ. Mus. Hist. Nat. "Javier Prado," Lima, Zool., (A), no. 6, p. 9 (possible syn. *fumosus* Miller).

*Vampyrops fumosus* Miller, 1902, Proc. Acad. Nat. Sci. Philadelphia, 1902: 405; Sanborn, 1936, Field Mus. Nat. Hist., Zool. Ser., 20: 101—Ecuador (meas.); op. cit., 27: 377—Peru; Poole and Schantz, 1942, Bull. U. S. Nat.

Mus., 178: 137 (type history); Sanborn, 1951, Publ. Mus. Nat. Hist. "Javier Prado," Lima, Zool., (A), no. 6, p. 9—Peru (meas., syn. of *infuscus* Peters?).

*Type localities*.—*Vampyrops vittatus*: Puerto Cabello, Carabobo, Venezuela. *V. infuscus*: Grotto of Ninabamba, Hacienda Ninabamba, Province of Hualgayoc, Department of Cajamarca, Peru. *V. fumosus*: Hyutanaham, upper Purus River, Brazil.

*Types*.—*Vampyrops vittatus*: ?. *V. infuscus*: Warsaw Museum; collected by Taczanowski. *V. fumosus*: U. S. National Museum no. 105530; adult female, skin and skull; collected March 4, 1901, by J. B. Steere.

*Range*.—Known from Venezuela, Ecuador, Colombia, Peru, and western Brazil. Dobson recorded a purchased specimen in the British Museum (Natural History) from Costa Rica, but this locality is open to question.

*Description*.—The largest species; forearm 52.0–61.5 mm.; greatest length of skull 30.0–32.3 mm.; upper tooth row 12.0–13.2 mm. The color ranges from dull brown to black, with dorsal stripe clear white; it may be prominent, faintly indicated, or absent. The facial stripes are well marked and dull brown or absent. In the skull, pm<sup>3</sup> shows great variation in size.

*Measurements* (Peruvian specimens in parentheses).—Forearm 52.0–61.5 mm. (55.0–61.5); third finger, metacarpal 59.0–59.9 (54.0–58.9), first phalanx 21.8–24.7 (22.4–24.0), second phalanx 31.1–34.3 (31.0–33.6), third phalanx 21.7–24.5 (21.9–24.9); fourth finger, metacarpal 53.8–58.5 (52.8–57.9), first phalanx 18.7–19.9 (17.9–20.6), second phalanx 20.6–23.9 (20.9–22.9); fifth finger, metacarpal 56.5–61.4 (54.9–61.0), first phalanx 14.7–15.6 (13.8–16.3), second phalanx 17.9–20.8 (18.2–19.9). Tibia 22.8–23.5 (21.5–24.1).

Skull: greatest length 30.0–32.7 mm. (30.3–32.3); condylo-basal length 27.0–30.0 (27.0–29.4); palatal length 12.5–14.6 (13.2–14.0); interorbital width 6.8–7.4 (6.5–7.2); zygomatic width 18.0–19.8 (18.2–19.0); mastoid width 14.7–15.7 (14.3–15.8); width of braincase 12.3–13.5 (12.3–13.2); upper tooth row 12.0–13.2 (12.0–12.6); width across base of canines 7.6–8.4 (8.0–8.8); width across outer edges of molars 13.7–14.9 (13.5–14.5).

*Specimens examined*.—Total 49. VENEZUELA: San Esteban, 1 male, 1 female (BM). COLOMBIA: Santa Marta, 1 male, 1 female (BM); Victoria, Santa Marta, 1 male, 1 female (BM); Valdivia, 1 female (BM); Río Macayo, Canquete, 1 male (alc.), 1 female (CNHM); Valparaiso, Santa Marta, 2 no sex (AMNH); Ricarte,

1 male, skull only (AMNH); Villavicencio, 1 no sex (CNHM). BRAZIL: Purus River, 1 female, type (USNM). ECUADOR: Sumaco, Oriente, 1 male (BM); Boca Río Curaray, 6 no sex (AMNH); Río Pindo Yaco, Oriente, 2 males, 1 female; Montalvo, Río Bobonaso, 1 male; Río Copataza, Oriente, 1 female; Barros, Oriente, 1 male; Río Cotapino, Oriente, 1 male (CNHM). PERU: Vitoc Valley, Tarma, Junín, 1 male, 2 females (alc.); Hacienda Cadena, Cuzco, 4 males, 2 females; Huajyumbe, Cuzco, 5 males, 3 females; San Juan Grande, Cuzco, 1 male, 3 females (2 alc.); all CNHM.

*Habitat*.—Ecuadorian specimens are marked as coming from holes in trees and one from a hole in a termite nest, but this information may not be accurate. The type of *infuscus* and all specimens from southeastern Peru were found in caves. Those from Junín roosted "in the ruins of an abandoned huge farm in the forest." In Colombia, Philip Hershkovitz found three roosting under tree roots exposed on the side of a low bank along a stream.

*Remarks*.—Specimens from southeastern Peru named *fumosus* were compared with two near topotypes from San Esteban, Venezuela, by Miss Laurie in the British Museum (Natural History). She reported that "externally, though the measurements are much the same, the white stripes on the head and back are much more prominent in *vittatus* than in *fumosus*. In the skull the upper cheek teeth of *fumosus* are obviously narrower than those of *vittatus*; the teeth in the lower jaw also differ in size."

The white striping is extremely variable, being present in one and absent in another of two specimens from the same locality taken the same day. A comparison of all material has shown no constant difference in the width of the molars.

The type of *infuscus* from northern Peru was described as having no white dorsal stripe. The forearm is short (52.0 mm.) but is equaled by a specimen from Ecuador. From the description, it appears to differ from *fumosus* (= *vittatus*) only in the absence of the white dorsal stripe.

There are no material barriers between these three species: *vittatus*, from Venezuela and Colombia; *infuscus*, from northern Peru; and *fumosus* from western Brazil, east-central and southeastern Peru. They are here considered as one species, *vittatus*.

### **Vampyrops dorsalis** Thomas

*Vampyrops dorsalis* Thomas, 1900, Ann. Mag. Nat. Hist., (7), 5: 269; Allen, 1916, Bull. Amer. Mus. Nat. Hist., 35: 226—Colombia; Sanborn, 1951,



Publ. Mus. Nat. Hist., "Javier Prado," Lima, Zool., (A), no. 6, p. 10—southeastern Peru.

*Vampyrops lineatus* Bangs, 1900, Proc. N. E. Zool. Club, 1: 100—Colombia (San Antonio, Palomino; San Miguel [type of *umbratus*]).

*Vampyrops umbratus* Lyon, 1902, Proc. Biol. Soc. Washington, 15: 151; Allen, 1931, Bull. Mus. Comp. Zool., 71: 236 (type history); Hershkovitz, 1949, Proc. U. S. Nat. Mus., 99: 443—Colombia (meas.).

*Vampyrops oratus* Thomas, 1914, Ann. Mag. Nat. Hist., (8), 14: 411.

*Type localities.*—*Vampyrops dorsalis*: Paramba, Ecuador. *V. umbratus*: San Miguel, 5,260 feet, northern slope of Sierra Nevada de Santa Marta, Department of Magdalena, Colombia. *V. oratus*: Galifari, alt. 6,500 feet, Sierra de Avila, northern Venezuela.

*Types.*—*Vampyrops dorsalis*: British Museum (Natural History) no. 99.12.5.1; skin and skull; collected April 14, 1899, by R. Miketta. *V. umbratus*: Museum of Comparative Zoology no. 8180; male, skin and skull; collected June 8, 1898, by E. A. and O. Bangs. *V. oratus*: British Museum (Natural History) no. 14.7.27.1; adult male, skin and skull; collected December 13, 1913, by S. M. Klages.

*Range.*—Known from Venezuela, Colombia, Ecuador, and southeastern Peru.

*Description.*—Intermediate in size between *vittatus* and *lineatus*, forearm 41.9–49.0 mm., greatest length of skull 25.0–27.5, length of upper tooth row 9.5–10.9. The color is a dark gray-brown or almost black, paler below. The facial and dorsal stripes are usually present. The skull is like that of *vittatus* but smaller, and the last molar is relatively large.

*Measurements.*—Forearm 41.9–49.0 mm. External measurements of two males (alc.): tibia 16.1–16.1; third finger, metacarpal 43.3–43.9, first phalanx 16.6–17.6, second phalanx 22.6–23.5, third phalanx 18.5–18.8; fourth finger, metacarpal 41.4–41.9, first phalanx 14.6–15.1, second phalanx 15.2–15.9; fifth finger, metacarpal 42.1–43.5, first phalanx 11.1–11.5, second phalanx 12.5–12.7.

Skull: greatest length 25.0–27.5 mm.; condylo-basal length 23.0–25.1; palatal length 10.6–13.7; interorbital width 6.2–6.8; intertemporal width 6.0–6.3; zygomatic width 14.4–16.2; mastoid width 12.4–13.5; width of braincase 10.6–11.3; upper tooth row 9.5–10.9; width across outer edges of canines at base 5.8–6.9; width across outer edges of molars 10.4–11.5.

*Specimens examined.*—Total 10. COLOMBIA: Sierra de Perija, Sierra Nigra Magdalena, 4 males (2 alc.), 1 female (USNM); San Sebastian, 2,000 meters, 1 male (CNHM). ECUADOR: Paramba,

1,100 meters, 1 no sex, type of *dorsalis* (BM); Tinguilla Valley, 1,500 meters, 1 subadult male (CNHM). PERU: Cuzco, Camante, 2,000 meters, 1 male (CNHM). VENEZUELA: Galifari, 6,500 feet, Sierra de Avila, 1 male, type of *oratus* (BM).

*Habitat*.—One Colombian specimen was taken from a group of three roosting under tree roots at the top of a ten foot canyon wall. Others were found in fissures in limestone cliffs in ones, twos, and threes. The Peruvian specimen was taken "in moss on tree," according to the collector.

*Remarks*.—*Vampyrops dorsalis* was described from Ecuador in 1900 by Oldfield Thomas. Dr. M. W. Lyon, Jr., described *umbratus* in 1902 from Colombia. He made no reference to *dorsalis* in his original description and could not have been familiar with it. The description and measurements of both species are very similar. While but ten specimens have been available for examination, no differences can be found to separate *umbratus* from *dorsalis*.

The skull of the type of *oratus* Thomas has been examined. The difference described—the development of the inner ledges of the molars—appears to be individual variation. It agrees in size with *dorsalis*.

A specimen of *dorsalis*, without skull, was recorded by J. A. Allen (1916) from Ricarte, Colombia. A skull was associated with the skin when examined. The forearm is broken but is estimated to be about 50.0 mm. The skull, however, is too large for *dorsalis* and equals measurements of *vittatus*. It is believed that the skin represents *dorsalis* and the skull *vittatus*.

### **Vampyrops lineatus** E. Geoffroy

*Phyllostoma lineatum* Geoffroy, 1810, Ann. Mus. Nat. Hist. Nat., Paris, 15: 180; Wagner, 1844, Suppl. Schreb. Säugeth., 1: 408; op. cit., 1855, 5: 633; Burmeister, 1854, Thiere Bras., p. 48.

*Artibeus lineatus* Gray, 1838, Mag. Zool. Bot., 2: 487.

*Artibaes lineatus* Gervais, 1855, Exped. Castelnau, Zool., p. 35, pl. 10, fig. 2 (teeth).

*Vampyrops lineatus* Peters, 1865, Monatsber. Akad. Wiss. Berlin, 1865: 356; op. cit., 1876: 430, pl. 1, figs. 8–14 (head, tragus, skull, teeth); Dobson, 1878, Cat. Chirop., p. 522 (descr., meas.); Alston, 1879, Biol. Centr.-Amer., p. 48; Goeldi, 1893, Mamm. Bras., p. 59; Allen, 1889, Proc. Acad. Nat. Sci. Philadelphia, 1889: 218 (wings); Thomas, 1901, Ann. Mag. Nat. Hist., (7), 8: 442—Paraguay (color); Thomas, 1903, Proc. Zool. Soc. London, 1903, pt. 2, p. 235—Brazil; Allen, 1908, Bull. Mus. Comp. Zool., 52: 38—eastern Brazil (meas.); Toldt, 1908, Denksch. Akad. Wiss. Wien, 76: 45—Brazil; Thomas, 1910, Ann. Mag. Nat. Hist., (8), 6: 500—northeastern Brazil; Cabrera, 1912, Trab. Mus. Nac. Cien. Nat., no. 11,

p. 44; Allen, 1916, Bull. Amer. Mus. Nat. Hist., 35: 599—Brazil (habits, habitat); Cabrera, 1917, Trab. Mus. Nac. Cien. Nat., no. 31, p. 14—Brazil; Sanborn, 1932, Ann. Carnegie Mus., 21: 178—Bolivia; Cunha Vieira, 1942, Arq. Zool., São Paulo, 3: 335, fig. 27 (animal)—Brazil (meas.).

*Vampyrops lineatus sacrillus* Thomas, 1924, Ann. Mag. Nat. Hist., (9), 13: 236.

*Type localities.*—*Vampyrops lineatus*: Paraguay. *V. lineatus sacrillus*: Río Doce, Espiritu Santo, Brazil.

*Types.*—*Vampyrops lineatus*: not known. *V. lineatus sacrillus*: British Museum (Natural History) no. 23.12.12.9; adult male; received from Buenos Aires Museum; provisional number 54.

*Range.*—Eastern Brazil from Pernambuco to Santa Catarina, and west through Paraguay and southern Mato Grosso to eastern Bolivia.

*Description.*—A medium-sized species with a forearm of 43.7–50.1 mm., greatest length of skull 23.9–26.1, and length of upper tooth row 8.5–9.3. The white dorsal and facial stripes are always prominent. The general color of the upper parts is dark brown and in individuals in worn pelage a lighter gray brown. The under parts are always lighter than the upper. *V. lineatus* is lighter-colored than all the other species except *helleri*, from which it may be distinguished by its larger size.

*Measurements.*—Forearm 43.7–50.1 mm. External measurements of one male, seven females (alc.): tibia 16.8–20.0; third finger, metacarpal 43.2–48.2, first phalanx 15.9–17.9, second phalanx 22.0–25.2, third phalanx and tip 15.1–18.5; second finger, metacarpal 41.9–46.0, first phalanx 13.6–14.5, second phalanx 16.4–18.8; third finger, metacarpal 43.3–47.4, first phalanx 10.5–11.2, second phalanx 13.4–15.5.

Skull: greatest length 23.9–26.1 mm.; condylo-basal length 21.2–23.4; palatal length 9.5–11.4; interorbital width 5.9–6.6; zygomatic width 13.6–15.1; mastoid width 11.7–12.7; width of braincase 10.3–11.2; upper tooth row 8.5–9.3; width across canines 5.3–6.3; width across molars 9.8–10.8.

*Specimens examined.*—Total 60. BRAZIL: Salto Grande, Parana, 1 female (USNM); Urucum, Mato Grosso, 5 males (3 alc.), 21 females (14 alc.) (CNHM); Fazenda Capao Bonito, Mato Grosso, 1 male (alc.), 27 females (alc.); Valparaíso, São Paulo, 1 female (alc.). PARAGUAY: Sapucay, 1 female (CNHM), 2 females (alc.) (USNM). BOLIVIA: Cercado, Santa Cruz, 1 female (CNHM).

*Habitat.*—Specimens from Urucum, Mato Grosso, were taken on the first floor of an old saw mill. A large cluster, or ball, containing



from fifty to seventy-five individuals, hung from the rafters in a fairly light place. Another smaller group was below the floor in a slightly darker location. This appears to be the only species that lives in large colonies, the others being found singly or in much smaller groups.

*Remarks.*—Thomas described *V. l. sacrillus* as having “the skull and teeth smaller” than in *lineatus*. The measurements show that the greatest length of the type skull is 0.6 mm. shorter and the tooth row 0.1 mm. shorter than the minimum for *lineatus*. The type locality of *sacrillus* is in the center of the coastal range of *lineatus* and there appears to be no geographic reason for subspeciation. It is here considered a synonym of *V. lineatus*.

### **Vampyrops helleri Peters**

*Vampyrops helleri* Peters, 1866, Monatsber. Akad. Wiss. Berlin, 1866: 392; Dobson, 1878, Cat. Chiro., p. 524; Allen, 1889, Proc. Acad. Nat. Sci. Philadelphia, 1889: 318; Lyon, 1902, Proc. U. S. Nat. Mus., 24: 149—Venezuela (habitat, breed., meas., color); Bangs, 1905, Bull. Mus. Comp. Zool., 46: 140—Panama; Miller, 1912, Proc. U. S. Nat. Mus., 42: 25—Panama; Goldman, 1920, Smiths. Misc. Coll., 69, no. 5, p. 200—Panama (descr.); Goodwin, 1942, Bull. Amer. Mus. Nat. Hist., 79: 23 (descr., meas.); 1946, op. cit., 87: 319—Costa Rica (descr., meas.); Hall and Jackson, 1953, Univ. Kansas Publ., Mus. Nat. Hist., 5: 645—Panama Canal Zone (weight).

*Vampyrops zarhinus* Allen, 1891, Proc. Acad. Nat. Sci. Philadelphia, 1891: 400; Thomas, 1901, Ann. Mag. Nat. Hist., (7), 8: 512—Pará, Brazil (teeth); Osgood, 1914, Field Mus. Nat. Hist., Zool. Ser., 10: 178—Peru; Goldman, 1920, Smiths. Misc. Coll., 69, no. 5, p. 200 (equals *helleri*); Thomas, 1928, Ann. Mag. Nat. Hist., (10), 2: 259, 288—Peru; Allen, 1931, Bull. Mus. Comp. Zool., 71: 236 (type history); Cunha Vieira, 1942, Arq. Zool., São Paulo, 3: 355—Pará, Brazil; Sanborn, 1949, Jour. Mamm., 30: 282—Peru (meas.).

*Vampyrops lineatus* Ferrari-Perez, 1886, Proc. U. S. Nat. Mus., 9: 128—Mexico; J. A. Allen, 1893, Bull. Amer. Mus. Nat. Hist., 5: 238—Costa Rica; Festa, 1906, Boll. Mus. Zool. Anat. Comp. R. Univ. Torino, 21, no. 524, p. 6—Darien, Panama.

*Vampyrops zarhinus incarum* Thomas, 1912, Ann. Mag. Nat. Hist., (8), 9: 408.

*Type localities.*—*Vampyrops helleri*: Mexico. *V. zarhinus*: Pas Obispo, Canal Zone, Panama; originally quoted as Thayer Expedition, Brazil. *V. zarhinus incarum*: Pozuzo, Peru.

*Types.*—*Vampyrops helleri*: ?. *V. zarhinus*: Museum of Comparative Zoology no. 3211; female in alcohol; Hassler Expedition 1872. *V. zarhinus incarum*: British Museum (Natural History) no. 12.1.15.1; collected by L. Egg; adult male in alcohol; skull removed and cleaned.

*Range*.—From Mexico (Chiapas and Oaxaca) south to Trinidad and to Amazonas, Brazil, on the east, and to east-central Peru (Pucalpa on the Río Ucayali) on the west.

*Description*.—The smallest species, with forearm of 36.5–41.3 mm., greatest length of skull 20.0–23.0, and length of upper tooth row 7.0–8.5. The facial and dorsal stripes are always present. The color is some shade of brown, about as in *lineatus*. Specimens from Matapalo, Tumbes, northern Peru, are much darker than one from Yurimaguas, Loreto, and two from Pucalpa, Loreto, Peru.

*Measurements*.—Forearm 36.5–41.3 mm. External measurements of four males: tibia 14.4–15.9, calcar 3.0–4.5; third finger, metacarpal 39.0–41.7, first phalanx 13.6–14.9, second phalanx 20.5–23.7, third phalanx and tip 13.5–14.4; fourth finger, metacarpal 36.5–38.9, first phalanx 11.8–12.5, second phalanx 12.5–14.8; fifth finger, metacarpal 37.4–39.4, first phalanx 9.3–10.0, second phalanx 11.7–13.3.

Skull: greatest length 20.0–23.0 mm.; condylo-basal length 17.9–20.7; palatal length 7.7–10.7; interorbital width 4.9–6.2; intertemporal width 5.2–5.9; zygomatic width 11.5–13.0; mastoid width 9.6–11.1; width of braincase 8.9–9.8; upper tooth row 7.0–8.5; width across canines 4.9–5.8; width across molars 8.2–9.7.

*Specimens examined*.—Total 33. MEXICO: Fulta, Oaxaca, 1 male (CNHM). HONDURAS: Tapasuna, 2 males (CNHM). COSTA RICA: Guayabo, 1 male, 1 female (CNHM); Jiminez, 1 female (AMNH). PANAMA: Cabina, 2 males (alc.) (USNM); Cana, 1 female (USNM). FRENCH GUIANA: Cayenne, 2 males (CNHM). TRINIDAD: Spring Hill, 1 female (alc.), skull cleaned (AMNH). BRAZIL: Orosó, Rio Amazonas, 4 females (AMNH). VENEZUELA: Tachira, Colon, 2 males (1 alc.), 1 female (CNHM); San Julian, 4 females (USNM). COLOMBIA: Cacagualito, 1 female (AMNH); Sasaima, 1 female (AMNH). PERU: Matapalo, Tumbes, 3 males (CNHM); Yurimaguas, Loreto, 1 female (CNHM); Pucalpa, Loreto, 2 females (CNHM); Rio Mayan, 1 female (AMNH).

*Habits*.—Lyon (1902) reported that the four females taken in Venezuela “were found hanging together from the under side of some large plantain-like leaves in the dense and gloomy thicket at the foot of a cliff.” The Peruvian specimens from Tumbes were shot in flight.

*Remarks*.—*V. Z. incarum* Thomas from Pozuzo, Huánuco, Peru, is the southernmost record for the species. It was described as smaller than *helleri* but on one specimen the difference is so little as

to be attributable to individual variation. It is here considered as a synonym of *helleri*.

### **Vampyrops recifinus** Thomas

*Vampyrops recifinus* Thomas, 1901, Ann. Mag. Nat. Hist., (7), 8: 192 (footnote); Cunha Vieira, 1942, Arq. Zool., São Paulo, 3: 356—Pernambuco (meas., descr.).

*Type locality*.—Pernambuco (Recife), State of Pernambuco, Brazil.

*Type*.—British Museum (Natural History) no. 81.3.16.4. Collected by W. A. Forbes.

*Range*.—Pernambuco, Sete Lagoes, Minas Gerais, and Ceara, Brazil; Demerara, British Guiana.

*Description*.—Intermediate in size between *helleri* and *lineatus*; larger than the former and about the size of the minimum for the latter. Forearm 41.0–43.0 mm.; greatest length of skull 23.9–24.1; length of upper tooth row 8.3–8.9 mm. The color is as in *lineatus*. The upper incisors are slightly larger than in *helleri* and smaller than in *lineatus*.

*Measurements*.—Forearm 41.0–43.0 mm. External measurements of two females (alc.): tibia 16.5–17.2 mm.; third finger, metacarpal 43.5–43.5, first phalanx 14.4–15.8, second phalanx 23.5–23.9, third phalanx 14.3–15.5; fourth finger, metacarpal 41.4–42.4, first phalanx 12.2–13.1, second phalanx 14.0–14.5; fifth finger, metacarpal 42.3–43.2, first phalanx 9.8–10.9, second phalanx 10.8–12.6.

Skull: greatest length 23.9–24.1 mm.; condylo-basal length 20.2–21.7; palatal length 8.2–9.9; interorbital width 5.7–6.1; zygomatic width 13.8–14.0; mastoid width 11.3–11.6; width of braincase 9.5–10.3; length of upper tooth row 8.3–8.9; width across outer edges of canines at base 5.6–6.0; width across outer edges of molars 9.9–10.4.

*Specimens examined*.—Total 4. BRAZIL: Pernambuco, 1 male (BM, type); Sete Lagoes, Minas Gerais, 1 female (alc.), skull clean (BM); São Paulo, Serra de Ibiapaba, Ceara, 1 male (CNHM). BRITISH GUIANA: Demerara, 1 female (alc.), skull cleaned (BM).

*Habitat*.—The Ceara specimen is marked "shot in banana plantation."

*Remarks*.—This species is characterized mainly by its size. Thomas noted that the upper incisors were small and did not touch, but this size does not appear to be constant.